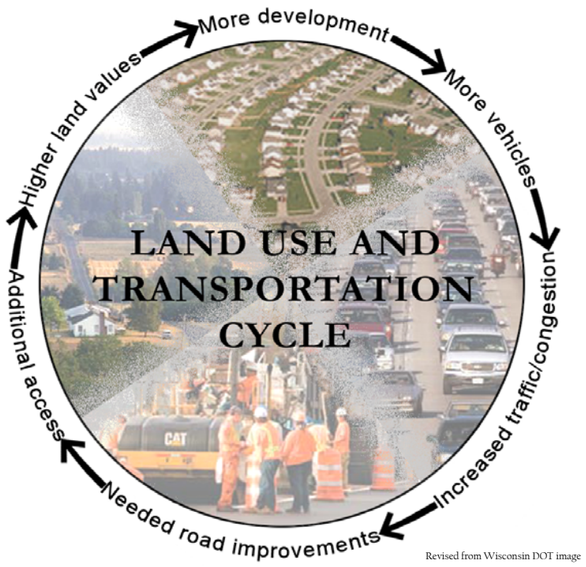
Chapter 5 – Land Use Considerations

Overview

While land use planning traditionally has been a stand-alone process, it does not exist in a vacuum. Transportation systems and land use patterns tend to influence each other in a cyclical pattern. Elements of transportation — including roads and pedestrian, bicycle, and transit facilities — can impact how land is developed in terms of density and even types of use. Further, where land uses fall and how they are distributed inevitably impacts decisions regarding where people travel and how transportation facilities are prioritized. If low-density development is spread out, residents must rely almost entirely on automobiles to get from one location or use to another. On the other hand, denser centers that combine complementary land uses near each other enable greater choice in transportation.

Because of this relationship between land use planning and transportation systems, the ***Woodruff Road Corridor Study*** must strive to strike a delicate balance. Plans, policies, and programs not only must preserve mobility through effective transportation, but also must reinforce a "sense of place" through land use that truly reflects the community.



Revised from Wisconsin DOT image

Vision, Goals, and Guiding Principles

The vision of the ***Woodruff Road Corridor Study*** recognizes the need for new development patterns by focusing on smart growth principles, sustainable development, and the community's character. Sustainable development — which can be measured by environmental stewardship, economic prosperity, and an equitable distribution of community resources — will be challenged by the growth in residences, office parks, research centers, shops, and restaurants over the next several decades. Accommodating these new residents and businesses will require a combination of focused development and redevelopment of existing underutilized parcels.

To fulfill the corridor's vision, local leaders have begun to join with the private development community to rethink the components of the area as well as the spatial relationships between them. Reorganizing the landscape into a more sustainable development pattern will require an evaluation of the four Ds commonly associated with the relationship between land use and transportation — density, diversity, design, and destinations. The four Ds have helped communities across the country balance the mobility and livability offered by land use and transportation.

Vision

"To create a healthy and sustainable environment that protects the access and mobility of the Woodruff Road area while utilizing **smart growth principals, encouraging sustainable development,** and **protecting the community character.**"

Goals

- Balance access and mobility in the corridor
- Address corridor safety concerns
- Identify potential aesthetic improvements
- Integrate with planned development
- Develop functional and implementable recommendations

Land Use and Development Patterns

To formulate a vision of sustainable growth and development within the Woodruff Road area, it is necessary to examine the existing land use profile, development patterns, and transportation system that serve the surrounding community.

Land Use Profile

During the 1970s, Woodruff Road existed as a rural two-lane highway. The land that surrounded the roadway was envisioned to develop into residential neighborhoods, with commercial nodes at major intersections such as SC 14. But as these neighborhoods filtered in from the east and new access was provided by Interstates 85 and 385, the role of the corridor began to shift. The Greenville Mall opened in 1978, and by the time Wal-Mart and Sam's Club opened in the 1990s, the corridor's role had transitioned. Despite being zoned for residential development, the corrior became a hub of commercial activity.

The land use pattern at Woodruff Road today is the result of planning decisions spanning more than two decades. Between 1982 and 2006, 12 rezoning petitions along Woodruff Road have been denied by the Planning Commission only to be approved by County Council — evidence of the influence that private development has on the area. The diagram below illustrates the variety of uses found along the corridor today. The diagram shows each building's use, including residential (yellow), commercial (red), office (blue), and industrial (purple). Though a mixture of uses is evident, development patterns to date have resulted in a segregation of these uses.

Development Patterns

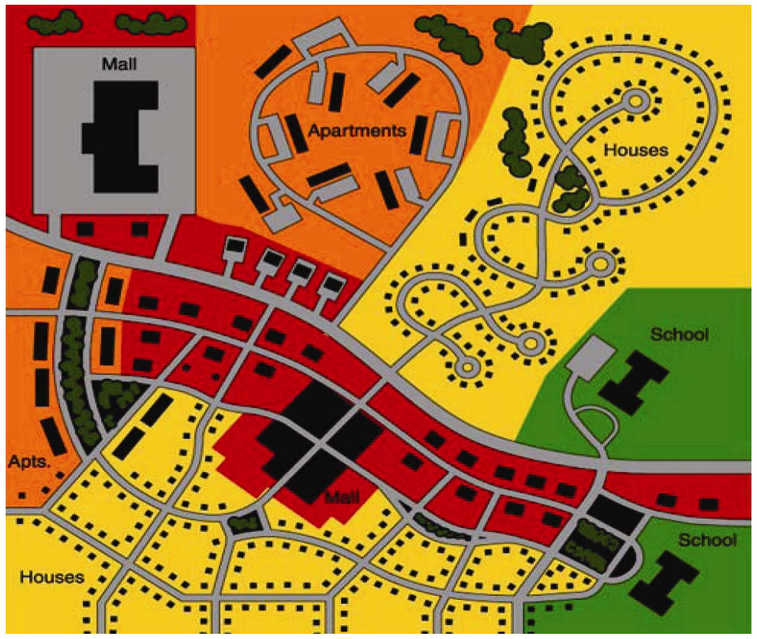
Throughout the Woodruff Road corridor, the separation of land uses and sprawling development patterns demonstrate a suburban form. (Scholars explain urban form as "the spatial footprint of our cities; measured by street patterns, block length, mix of land uses, maximum building height, average residential density, and non-residential intensity [Floor Area Ratio].") Residential, commercial, office, and industrial uses in the Woodruff Road area are generally isolated or, when located near each other, not well-connected. This means that most residents, employees, and visitors spend significant amounts of time and money driving around to accomplish even their day-to-day activities.

This physical distance between complementary land uses in a suburban setting tends to promote automobile travel, particularly since safe, convenient facilities are not readily available to pedestrians and bicyclists. The area's lack of connectivity between adjacent properties also forces traffic traveling between developments to use arterials such as Woodruff Road, thus contributing toward congestion. Increased traffic means less mobility for citizens and others traveling through the region.

Often, low population density contributes to development patterns that actually increase traffic. Because walking, bicycling, or public transit is rarely an option in the area, the average single-family, detached household is expected to generate five separate vehicle trips per day. That means more cars are on the road, for longer periods of time, trying to access their destinations. This suburban organization is similar to a street hierarchy popularized during the 1950s. Across the country, local, collector, and arterial streets were developed, favoring large block lengths, limited connections between adjacent developments, and single-point entry/exit points to the transportation network.

The top portion of the illustration on this page shows how each land use type is isolated from other uses, which for the most part represents what Woodruff Road looks like today. In the image, apartments, houses, the mall, and the school are all separated and forced to use a single route to connect to the larger road (i.e. Woodruff Road). This larger road, or arterial, was intended to accommodate travel between surrounding communities. Because the local traffic is now forced onto this single road, travelers experience congestion throughout the day, whether they are traveling to a neighboring community or just to the local mall. Such a configuration often is a product of zoning ordinances that separate uses and discourage mixed-use developments.

The traditional road network that existing before the 1950s included a grid network of different size streets. This well-connected network supported alternative choices for travel – different modes and different routes. Ultimately, the network placed less reliance on the arterial system. The lower portion of the diagram illustrates this traditional approach to transportation planning, which is a viable alternative to Woodruff Road. The same land uses are offered as in the suburban development, but the network of interconnected streets offers more options to travelers and reduces congestion on the arterial. The diversity of local travel options encourages better distribution of trips, thereby reducing the number of cars all traveling on the same route. This configuration also provides a safe environment for pedestrians and bicyclists to travel from one land use to another.



Source: Congress for the New Urbanism, 2006

> The first complaint one always hears about suburbia is traffic congestion. More than any other factor, the perception of excessive traffic is what causes citizens to take up arms against growth in suburban communities.
>
> - Andres Duany, Suburban Nation (2000)





Policy and Guidelines Toolbox

The following policies and guidelines should serve as a toolbox. The tools provide guidance to establish a more comprehensive, coordinated set of plans, programs, and policies that better balances land use (accessibility) and transportation (mobility) needs within the community. These tools were selected following discussions with City and County planning staff and a review of local land development and zoning ordinances.

Tool 1: Promote Sustainable Land Development

A development can have a positive or negative impact on the transportation system, either creating more congestion or providing alternate routes for traffic. The City and County should not only consider how a mix of land uses will relate when considering development opportunities but also keep in mind the way each use is accessed. If sustainable land development principles are followed, local officials can plan for land use and developments that reduce congestion. Offering smart alternatives will help limit the number and lengths of local trips as well as provide alternatives to the already congested Woodruff Road.

Efficient travel between land uses can be encouraged by promoting development patterns that favor higher densities and intensities, a mix of land uses, and an environment that accommodates pedestrians. In turn, the transportation system should connect complementary land uses and focus on more efficient travel behavior defined by mode and route choices.

To encourage on-site improvements for promoting a more sustainable land development pattern, the Woodruff Road area's transportation system should favor efficient travel between interior destinations and safe, predictable connections to adjacent properties. The orientation of buildings and parking lots should favor a "park once" mentality, whereby the design, location, and supply of parking promote a more balanced transportation environment that facilitates walking once arriving to the site.

By not providing excessive parking, the City and County will encourage pedestrian and bicycle travel and discourage automobile travel. Pedestrian walkways within a newly or re-developed site should connect building entrances and provide safe crossings. Locating parking and vehicle driveways away from building entrances also will encourage pedestrian activity. At the edges of development, rules and standards should be adopted that require purposeful connections to the public sidewalk and greenway system for promoting alternative modes of travel for accessing the site.

Compact, Mixed-Use Development

Newer developments such as the mixed-use project at The Point recognize the benefits of increased density, mixture of land uses, and pedestrian-friendly design.

Parking Once Districts

To promote sustainable land development, buildings should be oriented and parking located to favor a "park once" mentality. Excessive parking should be discouraged.

Internal pedestrian circulation at the Shops at Greenridge

"Sea of parking" at Wal-Mart

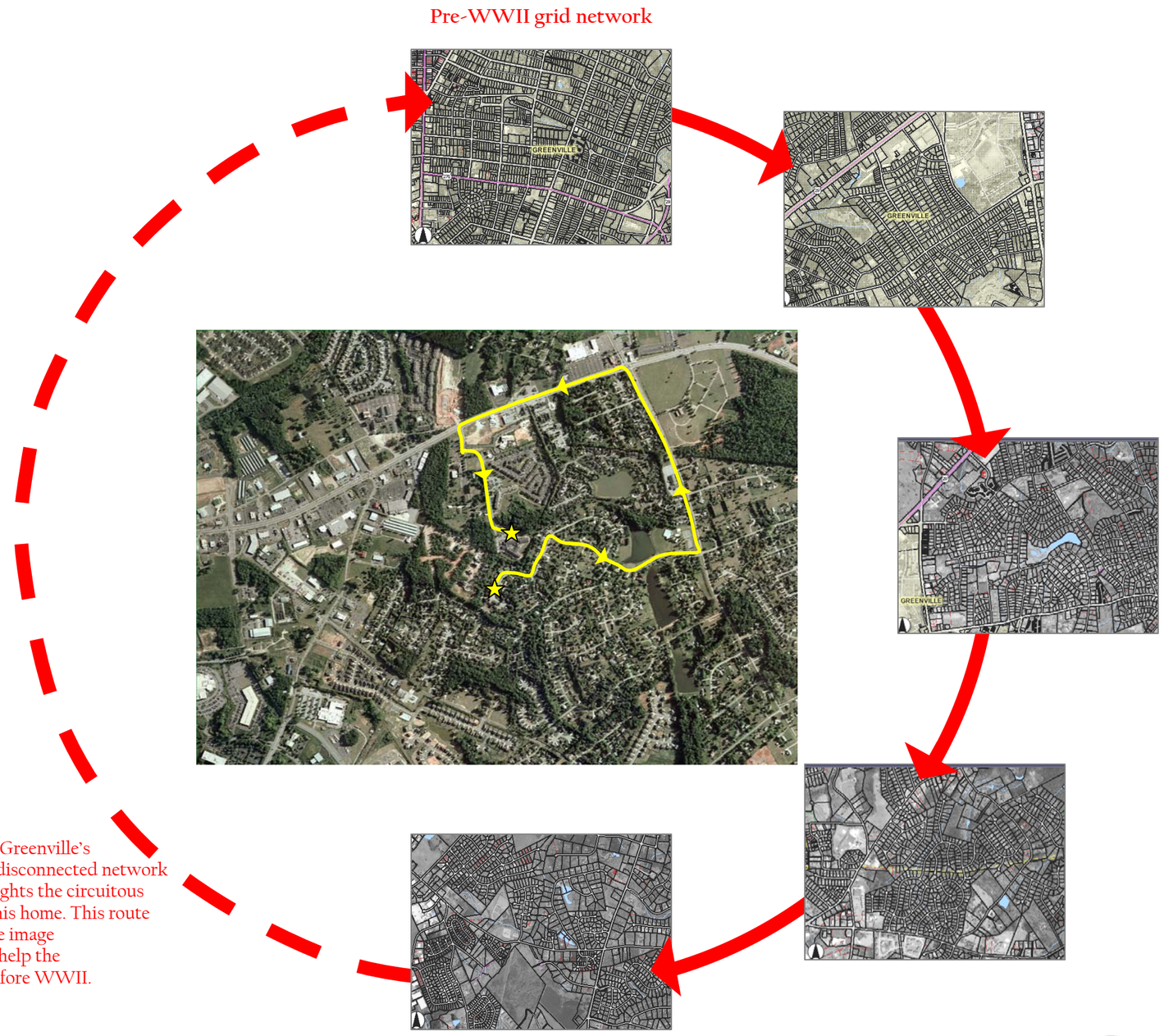
Tool 2: Support Efforts to Increase Connectivity Within and Between Developments

Street connectivity refers to the directness of routes and the density of connections (i.e., intersections) within a transportation system. As connectivity increases, travel distances decrease and route options increase, allowing the transportation system to be used more efficiently by pedestrians, bicyclists, transit, and automobiles. When the local street network is not sufficient, a thoroughfare such as Woodruff Road often becomes the preferred travel route. Unfortunately, this reduces regional mobility for through traffic.

A highly connected transportation system includes several options for entering or leaving a new development. Whenever possible, these options are located on secondary roads rather than highways. The number of street systems without access to other roads should be limited, just as cul-de-sacs would be restricted to areas where topography, environment, or existing development make other street connections prohibitive. Stub-outs should be encouraged and signed to accommodate future street extensions and connections with neighboring parcels. The City and County also should encourage developments to include regulations that require minimum street spacing, which will support efforts to more easily connect with other streets and developments.

Connectivity in the area should not be limited to automobiles, however. Encouraging a network of connected pedestrian and bicycle facilities can offer more transportation alternatives, especially when that network provides access to a variety of land uses, roadways, and developments. Greenway and pedestrian connections are highlighted in Chapter 2.

Connections need to be not only planned but also implemented during the development review process. Promoting a highly connected transportation system through implementation will require revisions to local zoning and subdivision ordinances.



The series of five images on the peripheral shows the historical transition of Greenville's development pattern – from a well-connected grid before WWII to today's disconnected network of arterials and cul-de-sacs. In the center of the diagram, a yellow line highlights the circuitous route a local resident must take to drive to a destination only 500 feet from his home. This route requires travel on both SC 14 and Woodruff Road. The circular nature of the image conceptualizes the idea that supporting efforts to increase connectivity can help the transportation network return to the more efficient network that existed before WWII.

Tool 3: Promote Development Design to Manage Access and Reduce Congestion Levels on Major Roadways

For the area to truly achieve transportation efficiency, the City and County will need to consider the potential conflicts between the transportation system's mobility (transportation) and accessibility (land use). Access management will help balance mobility and accessibility.

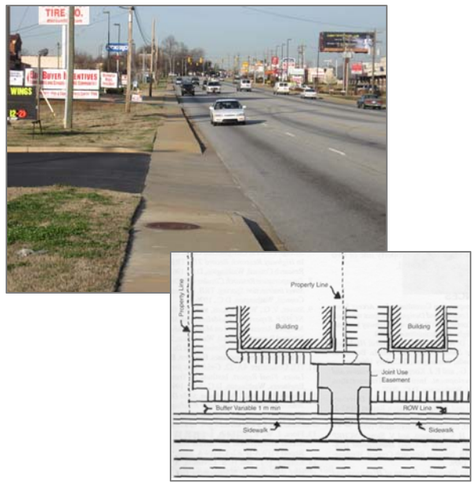
From a land use perspective, the number, location, and spacing of driveways along the street network significantly impact vehicular movements and levels of congestion. Land use and transportation professionals agree that the number of driveways or curb cuts serving a property should be minimized and that regulations and incentives can be used to encourage shared-use driveways. Greenville can promote greater street network efficiency through cross access agreements, which limit the number of driveways and allow roadway access for multiple parcels across a single property.

Building on the momentum of this collaborative planning process, local leaders should partner with SCDOT to review the state's current access management guidelines and local ordinances that regulate access to the street network. Following this review, a formal access management overlay ordinance should enforce consistent access management standards that ensure the proper function of Woodruff Road. In particular, minimum spacing and maximum driveways per development should be regulated. Strengthening and enforcing minimum lot frontage requirements will prevent the establishment of small frontage lots along the corridor. In addition, regulations should encourage the construction of parallel routes for backdoor access. These routes can be integrated into the local street system when small frontage lots are unavoidable.

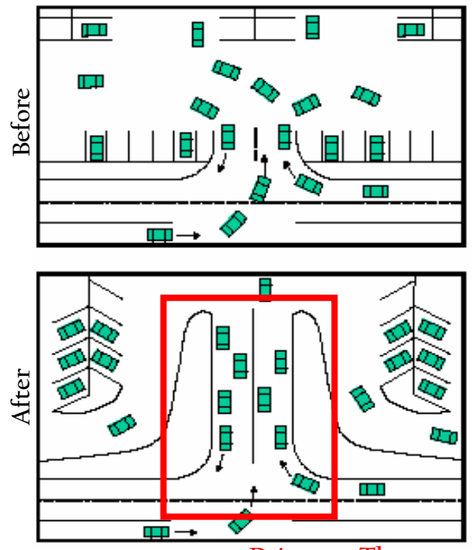
Implementation of access management tools can be accomplished in a number of ways — changing local zoning ordinances, developing an access management overlay ordinance, or approving rules and regulations for the subdivision and site plan review process to include application of access management solutions. More detailed access management techniques are discussed in Chapter 3.

Access Management Examples

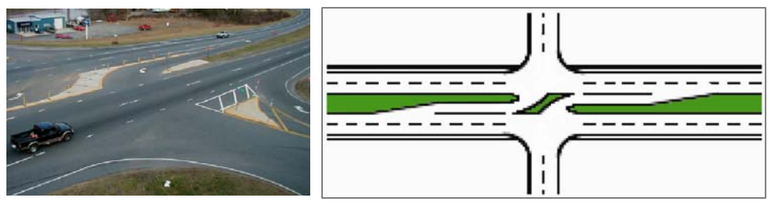
Shared Driveway Use



Internal Site Circulation



Regulating Left Turns (i.e. left-over treatment)







Recommendations

> Great streets do not just happen. Overwhelmingly, the best streets derive from a conscious act of conception and creation of the street as a whole. The hands of decision makers are visible.
>
> - Allan B. Jacobs

As mentioned, one of the key issues for addressing the necessary balance between land use and transportation priorities within the community is how various authorities work at different levels of government. SCDOT, the City of Greenville, and Greenville County have vested interests and responsibilities in the combined transportation and land use plan. In general, land use is the responsibility of the local government, while the responsibility of the transportation system falls on SCDOT. Building on the Policy and Guidelines Toolbox, the following recommendations are intended to improve the relationship between land use and transportation. These recommendations require a commitment by local and state government as well as private developers.

Desired Outcome: Improved coordination between land use and transportation

Transportation facilities can impact the density, intensity, and types of land uses. The location and type of land uses, in turn, influence where and how people travel. Promoting development patterns that favor higher densities and intensities, a mix of land uses, and an environment that accommodates pedestrians helps encourage the efficient use of the transportation system. These developments should be supported by a comprehensive transportation system that connects complementary land uses.

Recommended Action: **Adopt a special overlay district for the corridor.**

The development of a corridor-based special overlay district requires stakeholder involvement and public outreach focused on the specific strengths, opportunities, and needs of a given corridor. The preparation of the ***Woodruff Road Corridor Study*** included processes devoted to gathering such information. A special overlay district for Woodruff Road will unify two planning districts with differing regulations for the same types of uses. Such unification is critical given the frequent changes of the municipal boundary. A task force should be formed to explore and help facilitate the development of an overlay district.

Recommended Action: **Require sidewalks as the rule and waiver as the exception.**

Existing land development regulations leave sidewalk requirements to the discretion of the planning commission. Such practice inhibits the consistent development of pedestrian facilities. These regulations should be changed to require sidewalks on new streets and within existing developments.

Special Overlay District Ordinance Example

(c)Terminal islands, a minimum of 5-feet wide, shall be provided at the ends of all parking bays. Terminal islands shall contain at least one shade tree that may count toward required the number of trees for the site.

(d) For every two full parking bays (each including two aisles of parking and a lane) or as required in the table, a 5-foot wide divider median is required. The number of divider medians are required as follows (See Figure 2):

Number of Parking Bays	Number of Required Divider Medians
2	0
3-4	1
5-6	2
7-9	3
More than 10	1 divider median for every 3 bays

The divider median shall form a continuous strip between abutting rows of parking spaces. Shade or flowering trees within a divider median shall be planted at 30-foot intervals, unless the divider median is designed to function as a pedestrian path providing access from the parking area to the primary building entrance. The maximum spacing of trees shall not exceed 50 feet.

(e) Parking areas adjacent to the public right-of-way shall be screened from view from the public right-of-way. Screening shall be accomplished by a landscape buffer or a streetwall 30 to 54 inches high.

(f) Driveways providing access to the public roadways should not be placed along the front facade of the primary structure to minimize conflicts with pedestrians in the parking areas unless driveway placement is restricted by Georgia Department of Transportation or the City of Thomasville Engineer.

(g) Access Management/Connectivity

1. Driveways/Entrances per property are permitted as follows and must be consistent with the requirements of the Georgia Department of Transportation:

Property Frontage	No. of Driveways
Less than 100 feet	1
Greater than 100 feet	2

2. Properties with frontage less than 100 feet are encouraged to enter into an agreement with adjacent properties for shared access to minimize the number of driveway openings to maximize landscaping along the Overlay District corridors and median opportunities within the right-of-way.
3. Driveways/Entrances shall meet the minimum width of the Georgia Department of Transportation requirements, but not greater than 30 feet wide.
4. Provide a five foot wide sidewalk along public right-of-way, if sidewalk is not present at time of construction. Provide a five foot wide pedestrian connection between public sidewalk and the main entrance to all buildings.

Figure 1: Parking

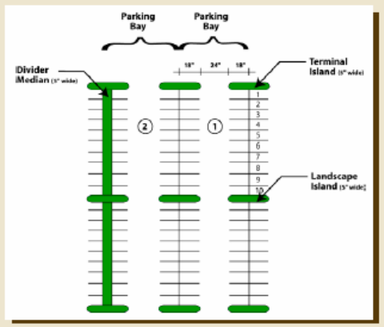
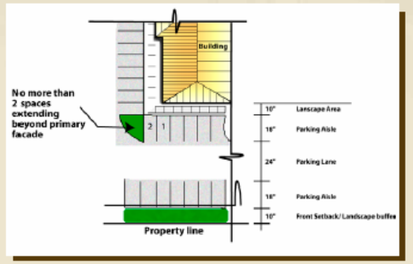


Figure 2: Parking Bays



SEC 22-94 OVERLAY DISTRICT DEVELOPMENT REQUIREMENTS- Landscaping/tree preservation

The landscape requirements within the Overlay Districts shall comply with the following provisions, unless within an historic district:

(a) Clear cutting of undeveloped properties is prohibited prior to submittal of an approved tree survey and approval of a landscape plan for the property.

(b) Existing tree cover and natural vegetation shall be preserved, whenever possible, or replaced with suitable native landscaping. All existing, healthy deciduous and hardwood trees with a caliper of ten or more inches at a point of three feet above the ground shall be retained, as indicated in an approved landscape plan.

(c) For new developments, all development applications shall include a tree survey for the project site. Trees which meet the requirements of exceptional trees as defined by the zoning code shall be preserved in accordance with the requirements of Section 20-29. All other hardwoods and deciduous trees including, but not limited to, ash, beech, cedar, crabapple, cypress, elm, hemlock, magnolia, maple, oak, and tupelo, with a

Kimley-Horn and Associates, Inc.

Recommended Action: **Examine parking standards.**

The City of Greenville requires off-street parking for all zoning districts except C-4 Central Business District (Sec. 50-198). However, some references in the regulations indicate that the number of spaces shall not exceed more than 125 percent of the total amount required, implying that oversupply of parking is permitted and exists. Parking standards tailored to the peak hours of the year should be revised.

Likewise, mixed-use developments require the minimum number of parking spaces to be equal to the sum of the required spaces for each type of use. This requirement does not account for "park once" districts in which a resident, employee, or visitor arrives in a vehicle but walks to multiple destinations within the development. Regulations that govern the orientation of buildings and parking lots can contribute to a "park once" mentality. By allowing fewer parking spaces and ensuring their proper location, the City and County will encourage pedestrian and bicycle travel and discourage excessive automobile travel.

Revisions to parking standards as they apply to the unique conditions of Woodruff Road can be accomplished during the development and adoption of the special overlay district and access management overlay district.

Recommended Action: **Define common design elements along the corridor.**

The City and County should work together to define common design elements that collectively reinforce a sense of place for the Woodruff Road corridor. These design elements then should be used to promote effective decisions regarding appropriate land use and development patterns for the area. In addition, a streetscape plan for Woodruff Road should be developed as a community initiative for protecting the long-term sustainability of the community. Elements of the streetscape plan may include plantable medians, street trees, highly visible crosswalks, pedestrian countdown signals, pedestrian-level lighting, and utility consolidations. This plan should be coordinated with the access management strategies presented in the ***Woodruff Road Corridor Study***.

Desired Outcome: Efficient use of the transportation system

An efficient transportation system includes an interconnected network of different size streets that offer varying levels of access and mobility depending upon their intended function. Connections to and between these streets should be planned in order to decease travel distances and increase route choice. This allows the transportation system to be used more efficiently by pedestrians, bicyclists, transit, and automobiles.

Recommended Action: **Adopt an access management overlay ordinance.**

Access management overlay ordinances have been adopted across the country to complement existing local zoning and subdivision regulations. An overlay ordinance will not change any of the rules and requirements associated with the underlying zoning district. The ordinance will provide a legal framework for the City and County to administer and enforce consistent access management standards along the corridor.

The ordinance should contain rules and requirements for the "core" components of a comprehensive access management strategy, including minimum spacing standards for traffic signals, median openings, and driveways; provisions for corner clearance, joint access, and connectivity; and design requirements for building access connections. The ordinance also should require cross access between adjacent properties, consolidation/elimination of excessive driveways, and retrofitting site access to the side and rear portions of the site. These standards will be applicable to properties abutting the corridor.

Recommended Action: **Adopt a formal connectivity ordinance.**

One of the guiding principles for the ***Woodruff Road Corridor Study*** came from a stakeholder who commented, "We can't really address our transportation issues unless we address street connectivity." A formal connectivity ordinance will increase the connections between existing and new developments and redevelopments by requiring coordination between the vehicular and non-vehicular circulation systems. Such ordinances have been instituted in cities and counties across the nation, including several localities in the Carolinas.

> *"We can't really address our transportation issues unless we address street connectivity."*

A standard connectivity ordinance embraces connections as a way to reduce the burden on arterial streets by offering a variety of routes between two destinations. In Cary, NC, connectivity is calculated by dividing the number of street links by the number of street nodes and intersections. A development must have a connectivity index of 1.2 or greater. This requirement can be waived by the Director of Development Services if it is deemed unreasonable to require such connections. However, when the requirement is waived, a six-foot pedestrian trail must be provided to link cul-de-sacs within a residential development. (See Section 7.10 at http://vic.townofcary.org/index.htm)

Street connectivity ordinances have been adopted throughout the United States, including the following localities in the Carolinas:

- Lancaster County, SC
- Rock Hill, SC
- Cary, NC
- Conover, NC
- Cornelius, NC
- Huntersville, NC
- Raleigh, NC

A blanket statement in the City of Greenville's regulations (Sec. 50-212) requires interconnectivity:

> Adjacent non-residential uses shall provide for vehicular and pedestrian circulation between their sites, through alley or parking lot connections, hard surface walkways, and similar measures. The Zoning Administrator may waive this requirement if, in his opinion, the requirement cannot reasonably be met.

While a connectivity policy has been in place for the County since the early 1990s, the policy is often ignored as evidenced by an increasingly disconnected transportation network. Though the policy remains in effect, a formal ordinance was never adopted.

A connectivity ordinance should be adopted by the City and County, using one of several numerical standards. The ordinance should limit the number of cul-de-sacs to areas where topography, environment, or existing development make other street connections prohibitive.

Recommended Action: **Revise land development regulation for cul-de-sacs.**

A major barrier to connectivity is the presence of cul-de-sacs. Currently, local ordinances allow cul-de-sacs up to 1,200 feet in length. The length of these dead-end streets can be extended beyond 1,200 feet as long as they provide bulge outs for U-turns. A review and revision of cul-de-sac design and location standards as permitted in local land development regulations should result in fewer and shorter cul-de-sacs, and thus improved connectivity. In locations that require cul-de-sacs due to topographic or environmental constraints, a six-foot pedestrian and bicycle trail should be constructed.

Revised land development regulations should prevent the construction of long cul-de-sacs such as the one formed by Market Point Drive.